Date: January 28, 2025
To: Board of Directors
From: Julie England, Reliability and Markets (R&M) Committee Chair
Subject: Oncor Wilmer 345/138-kV Switch Project

Issue for the ERCOT Board of Directors

ERCOT Board of Directors Meeting Date: February 4, 2025
Item No.: 9.3.4

Issue:
Whether the Board of Directors (Board) of Electric Reliability Council of Texas, Inc. (ERCOT) should accept the recommendation of ERCOT staff to endorse the need for the Tier 1 Oncor Electric Delivery Company LLC (Oncor) Wilmer 345/138-kV Switch Regional Planning Group (RPG) Project in order to meet the reliability requirements for the ERCOT System and address thermal and voltage violations in the Dallas, Kaufman, and Ellis Counties in the North Central Weather Zone, which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted unanimously to endorse.

Background/History:
Oncor proposed the Wilmer 345/138-kV Switch Project in July 2024, a $158.2 million, Tier 1 project with the expected in-service date of May 2026, to meet reliability planning criteria in the Dallas, Kaufman, and Ellis Counties in the North Central Weather Zone. Protocol Section 3.11.4.7, Processing of Tier 1 Projects, requires ERCOT to independently review submitted projects. ERCOT performed an independent review of the Oncor Wilmer 345/138-kV Switch Project and identified thermal and voltage violations in the Dallas, Kaufman, and Ellis Counties. The ERCOT project recommendation (Option 1), a $158.2 million, Tier 1 project with the expected in-service date of May 2026 addresses the need for a project under North American Electric Reliability Corporation (NERC) and ERCOT Planning Criteria to address thermal overloads on 29.3 miles of 138-kV transmission lines, 10.7 miles of 69-kV transmission lines, two 345/138-kV transformers, 11 voltage violations and 2 unsolved power flows in the Dallas, Kaufman, and Ellis Counties with the following ERCOT System improvements:

- Expand the existing Wilmer 138-kV substation to establish the new Wilmer 345/138-kV switchyard by installing eight 345-kV, 5000 A breakers and fifteen 138-kV, 3200 A breakers in breaker-and-a-half bus arrangements;
    - Install two 345/138-kV autotransformers with normal and emergency ratings of at least 700 MVA and 750 MVA each;
    - Install two 110.4 MVAr (in three 36.8 MVAr stages) 138-kV capacitor banks;

- Rebuild portion of the existing Watermill Switch to Tri Corner Switch 345-kV double-circuit transmission line with two separate double-circuit structures starting from Watermill Switch to structure number 102/3, utilizing the existing right of way (ROW) using a conductor with a normal and emergency rating of at least 2988 MVA, approximately 2.4-mile;
- Install two new 345-kV circuits from Watermill Switch to Wilmer Switch on each of the existing Watermill Switch to Tri Corner Switch 345-kV double-circuit structures using a conductor with a normal and emergency rating of at least 2988 MVA, 1.4-mile of the approximately 3.8-mile circuits will require new ROW;
- Terminate the existing Lavender Switch to Parkdale Switch 138-kV transmission line to the Wilmer 138-kV switch;
- Rebuild the existing Watermill Switch to Lavender Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 3.1-mile;
- Rebuild the existing Lavender Switch to Wilmer Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 1.2-mile;
- Convert the existing Wilmer Switch to Ferris Switch 69-kV transmission line to 138-kV operation with a normal and emergency rating of at least 764 MVA, approximately 4.0-mile;
- Relocate the existing Wilmer 138/69-kV autotransformer to the existing Ferris 69-kV switch; and
- Ensure all transmission line terminal and associated equipment elements are rated to meet or exceed 5000 A for 345-kV and 3200 A for 138-kV.

For construction to meet the May 2026 in-service date, the Oncor Wilmer 345/138-kV Switch Project (Option 1) requires Public Utility Commission of Texas (PUCT, Commission) approval of a Certificate of Convenience and Necessity.

ERCOT's independent review verified the reliability need for the Oncor Wilmer 345/138-kV Switch Project to satisfy ERCOT Planning Guide Section 4.1.1.2(1)(d), Reliability Performance Criteria, contingency for the loss of a single 345/138-kV transformer followed by a single transmission element or common tower outage.

RPG considered project overviews during meetings in September 2024 and December 2024. Between September 2024 and December 2024, ERCOT staff presented scope and status updates at RPG meetings in September, October, November, and December. Pursuant to paragraph (2) of Protocol Section 3.11.4.9, Regional Planning Group Acceptance and ERCOT Endorsement, ERCOT presented the Tier 1 project to the Technical Advisory Committee (TAC) for review and comment, and on January 22, 2025, TAC unanimously endorsed the project as recommended by ERCOT. Pursuant to paragraph (1)(a) of Protocol Section 3.11.4.3, Categorization of Proposed Transmission Projects, projects with an estimated capital cost of $100 million or greater are Tier 1 projects, for which Protocol Section 3.11.4.7(2) requires endorsement by the

Board. Pursuant to Section 3.11.4.9, ERCOT's endorsement of a Tier 1 project is obtained upon affirmative vote of the Board. Section IV(B)(2)(a) of the R&M Committee Charter includes R&M Committee review and recommendation to the Board regarding any Tier 1 project.

ERCOT's assessment of the Sub-Synchronous Resonance (SSR) of existing facilities in the Dallas, Kaufman, and Ellis Counties in the North Central Weather Zone, conducted pursuant to Protocol Section 3.22.1.3, Transmission Project Assessment, yielded no adverse SSR impacts to the existing and planned generation resources at the time of the study. Results of the congestion analysis ERCOT conducted pursuant to Planning Guide Section 3.1.3, Project Evaluation, indicated no additional congestion in the study area with the addition of the Oncor Wilmer 345/138-kV Switch Project (Option 1).

The project completion date is subject to change based on requirements for various approvals, and construction progress. Oncor will work with ERCOT as early as practical to develop outage plans needed for construction and implement Constraint Management Plans (CMP) based on expected operational conditions for the time period when construction outages are planned.

The report describing the ERCOT Independent Review of the Oncor Wilmer 345/138-kV Switch Project (Option 1), including ERCOT staff's recommendation, is attached as ***Attachment A***.

Key Factors Influencing Issue:

1. ERCOT System improvements are needed to meet reliability planning criteria in the Dallas, Kaufman, and Ellis Counties in the North Central Weather Zone.
2. ERCOT staff found the recommended set of improvements to be the most efficient solution for meeting the planning reliability criteria and addressing thermal overloads and voltage violations.
3. Protocol Section 3.11.4.7 requires Board endorsement of a Tier 1 project, which is a project with an estimated capital cost of $100 million or greater pursuant to Protocol Section 3.11.4.3(1)(a).
4. TAC voted unanimously to endorse the Tier 1 Oncor Wilmer 345/138-kV Switch Regional Planning Group (RPG) Project (Option 1), as recommended by ERCOT, on January 22, 2025.

Conclusion/Recommendation:

ERCOT staff recommends, and the R&M Committee is expected to recommend, that the Board endorse the need for the Tier 1 Oncor Wilmer 345/138-kV Switch RPG Project (Option 1), which ERCOT staff has independently reviewed, and which TAC has voted unanimously to endorse based on North American Electric Reliability Corporation (NERC) and ERCOT reliability planning criteria.

ELECTRIC RELIABILITY COUNCIL OF TEXAS, INC.
BOARD OF DIRECTORS RESOLUTION

WHEREAS, pursuant to Section 3.11.4.3(1)(a) of the Electric Reliability Council of Texas, Inc. (ERCOT) Protocols, projects with an estimated capital cost of $100 million or greater are Tier 1 projects, for which Section 3.11.4.7 requires endorsement by the ERCOT Board of Directors (Board); and

WHEREAS, after due consideration of the alternatives, the Board deems it desirable and in the best interest of ERCOT to accept ERCOT staff's and the and Reliability and Markets (R&M) Committee's recommendations to endorse the need for the Tier 1 Oncor Wilmer 345/138-kV Switch Regional Planning Group Project (Option 1), which ERCOT staff has independently reviewed and which the Technical Advisory Committee (TAC) has voted to endorse based on North American Electric Reliability Corporation (NERC) and ERCOT reliability planning criteria;

THEREFORE, BE IT RESOLVED, that the Board hereby endorses the need for the Tier 1 Oncor Wilmer 345/138-kV Switch Regional Planning Group Project (Option 1), which ERCOT staff has independently reviewed, and which TAC has voted to endorse based on NERC and ERCOT reliability planning criteria.

CORPORATE SECRETARY'S CERTIFICATE

I, Chad V. Seely, Corporate Secretary of ERCOT, do hereby certify that, at its February 4, 2025 meeting, the Board passed a motion approving the above Resolution by _____.

IN WITNESS WHEREOF, I have hereunto set my hand this ___ day of February, 2025.

_____
Chad V. Seely
Corporate Secretary

ERCOT Independent Review of the Oncor Wilmer 345/138-kV Switch Project

Document Revisions

Date	Version	Description	Author(s)
12/20/2024	1.0	Final	Ying Li
		Reviewed by	Robert Golen, Prabhu Gnanam

Executive Summary

Oncor Electric Delivery Company LLC (Oncor) submitted the Wilmer 345/138-kV Switch Project to the Regional Planning Group (RPG) in July 2024. Oncor proposed this project to address North American Electric Reliability Corporation (NERC) Reliability Standard TPL-001-5.1 and ERCOT Planning Guide criteria thermal overloads due to load growth in Dallas County and the surrounding areas in the North Central (NC) Weather Zone.

The Oncor proposed project is estimated to cost approximately $158.2 million and is classified as a Tier 1 project per ERCOT Protocol Section 3.11.4.3 and the proposed project will require a Certificate of Convenience and Necessity (CCN) application.

ERCOT performed an Independent Review, identified reliability issues (thermal overloads identified in Oncor's project submission in Dallas and neighboring counties, along with additional unsolvable contingencies and voltage violations in the study area) and evaluated four different transmission project options.

The ERCOT Independent Review (EIR) evaluated four different transmission project options. Based on the study results described in the Sections 5 and 6 of this report, ERCOT recommends the following option (Option 1) to address the reliability issues mentioned. Option 1 consists of the following:

- Expand the existing Wilmer 138-kV substation to establish the new Wilmer 345/138-kV switchyard by installing eight 345-kV, 5000 A breakers and fifteen 138-kV, 3200 A breakers in breaker-and-a-half bus arrangements.
    - Install two 345/138-kV autotransformers with normal and emergency ratings of at least 700 MVA and 750 MVA each.
    - Install two 110.4 MVAr (in three 36.8 MVAr stages) 138-kV capacitor banks.
- Rebuild portion of the existing Watermill Switch to Tri Corner Switch 345-kV double-circuit transmission line with two separate double-circuit structures starting from Watermill Switch to structure number 102/3, utilizing the existing right of way (ROW) using a conductor with a normal and emergency rating of at least 2988 MVA, approximately 2.4-mile.
- Install two new 345-kV circuits from Watermill Switch to Wilmer Switch on each of the existing Watermill Switch to Tri Corner Switch 345-kV double-circuit structures using a conductor with a normal and emergency rating of at least 2988 MVA, 1.4-mile of the approximately 3.8-mile circuits will require new ROW.
- Terminate the existing Lavender Switch to Parkdale Switch 138-kV transmission line to the Wilmer 138-kV switch.
- Rebuild the existing Watermill Switch to Lavender Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 3.1-mile.
- Rebuild the existing Lavender Switch to Wilmer Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 1.2-mile.

- Convert the existing Wilmer Switch to Ferris Switch 69-kV transmission line to 138-kV operation with a normal and emergency rating of at least 764 MVA, approximately 4.0-mile.
- Relocate the existing Wilmer 138/69-kV autotransformer to the existing Ferris 69-kV switch.
- Ensure all transmission line terminal and associated equipment elements are rated to meet or exceed 5000 A for 345-kV and 3200 A for 138-kV.

The cost estimate for Option 1 is approximately $158.2 million. One or more CCN applications will be required for the addition of the approximately 2.4-mile second circuits from Watermill Switch to structure number 102/3 and construction of the new 345-kV circuits from structure number 102/3 to Wilmer Switch on separate structures due to approximately 1.4-mile of new ROW. The expected In-Service Date (ISD) of this project is May 2026. However, Oncor has advised that the projected ISD may change based on requirements for various approvals and construction progress.

Oncor will work with ERCOT as early as practical to develop outage plans needed for construction and implement Constraint Management Plans (CMP) based on expected operational conditions for the time period when construction outages are planned.

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1 Introduction

In July 2024, Oncor Electric Delivery Company LLC (Oncor) submitted the Wilmer 345/138-kV Switch Project to the Regional Planning Group (RPG) to address North American Electric Reliability Corporation (NERC) Reliability Standard TPL-001-5.1 and ERCOT Planning Guide criteria thermal overloads in Dallas and neighboring counties due to new confirmed large load by agreement contract (396 MW in 2026 and full load of 756 MW in 2028). This proposed project is located in the North Central (NC) Weather Zone in Dallas and Ellis Counties.

This Oncor proposed project was classified as Tier 1 project pursuant to ERCOT Protocol Section 3.11.4.3, with an estimated cost of approximately $158.2 million. One or more Certificate of Convenience and Necessity (CCN) applications will be required for the construction of the 345-kV circuits from Watermill Switch to Wilmer Switch, due to approximately 1.4 miles of new right of way (ROW). The expected In-Service Date (ISD) of the project is May 2026.

ERCOT conducted an Independent Review for this RPG project to identify any reliability needs in the area and evaluate various transmission upgrade options. This report describes the study assumptions, methodology, and the results of ERCOT Independent Review of the project.

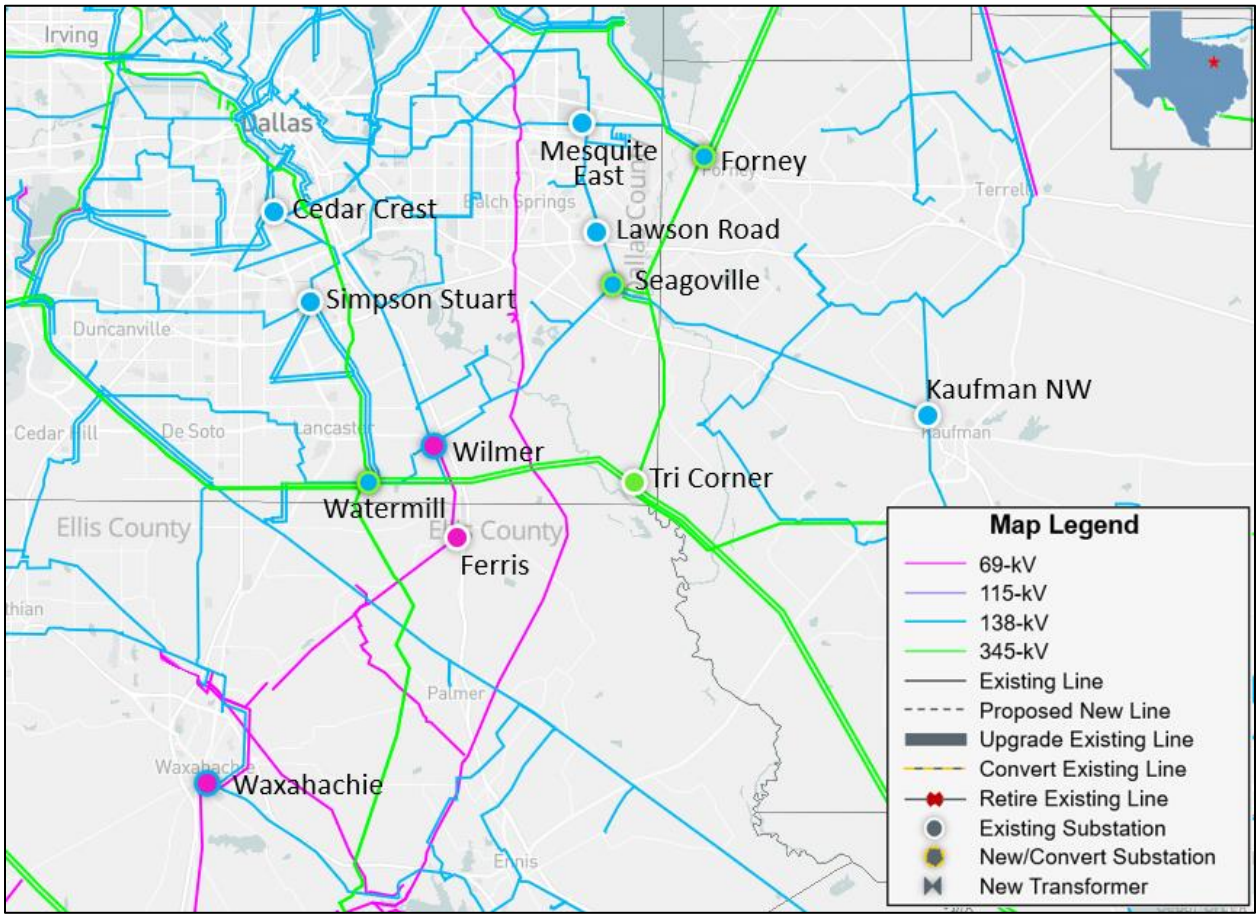

Figure 1.1: Map of Transmission System in Study Area

2 Study Assumptions and Methodology

ERCOT performed studies under various system conditions to identify any reliability issues and to determine transmission upgrades to support the proposed Wilmer 345/138-kV Switch Project if an upgrade is deemed necessary. This section describes the study assumptions and criteria used to conduct the independent study.

2.1 Study Assumptions for Reliability Analysis

This project is in the NC Weather Zone in Dallas and Ellis Counties. The bordering Kaufman and Rockwall Counties were also included in the study because of their electrical proximity to the proposed project.

2.1.1 Steady-State Study Base Case

The Final 2023 Regional Transmission Plan (RTP) cases, published on the Market Information System (MIS) on December 23, 2023, were used as reference cases in this study. Year 2028 Summer was selected for the long-term outlook. The steady-state study base case was constructed by updating transmission, generation, and loads of the following 2028 Summer peak load case for the North and North Central (NNC) Weather Zones:

- Case: 2023RTP_2028_SUM_NNC_12232023[1].

2.1.2 Transmission Topology

Transmission projects within the study area with ISDs by June 2028 were added to the study base case. The ERCOT Transmission Project Information and Tracking (TPIT)[2] report posted in June 2024 was used as a reference. The added TPIT projects are listed in Table 2.1.

Table 2.1: List of Transmission Projects Added to the Study Base Case

TPIT	Project Name	Tier	Project ISD	County
75628	Poetry 345 kV Switch	Tier 4	Oct-24	Kaufman
78371	Richardson East Switch – Richardson Spring Creek 138 kV Line Section	Tier 4	May-25	Dallas
78167	Add 2nd autotransformer at Trumbull	Tier 4	Nov-25	Ellis
66218B	Hillsboro - Italy 69 kV Line	Tier 4	Dec-25	Ellis
76135	Hackberry Switch – DFW D-East 2 138 kV DCKT Line Section	Tier 3	Dec-25	Dallas
81067	Balch Springs Tap – Balch Springs 138 kV Line Section	Tier 4	May-26	Dallas
23RPG017	Watermill 345/138-kV Switch Project	Tier 3	May-25	Dallas
23RPG018	Arlington Reliability Enhancement Project	Tier 2	May-26	Dallas
23RPG033	Watermill to Seagoville 138 kV Line Project	Tier 3	Dec-25	Dallas

[1] 2023 Regional Transmission Plan Postings: https://mis.ercot.com/secure/data-products/grid/regional-planning
[2] TPIT Report: https://www.ercot.com/gridinfo/planning

Transmission projects, listed in Table 2.2, identified in the 2023 RTP as placeholder projects in the study area and were not approved by RPG were removed from the study base case.

Table 2.2: List of Transmission Projects Removed from the Study Base Case

RTP Project ID	Project Name	County
2023-NC18	Tri Corner (2432) to Seagoville Switch (2433) to Forney Switch (2437) 345-kV Line Upgrade	Dallas
2023-NC38	Watermill 345/138-kV Transformer Upgrade	Dallas
2023-NC41	Watermill 138-kV Area Upgrades	Dallas
2023-NC42	Waxahachie Area 69-kV and 138-kV Line Upgrades	Dallas
2023-NC43	Wilmer 138/69-kV Transformer Upgrade	Dallas

2.1.3 Generation

Based on the August 2024 Generator Interconnection Status (GIS)[3] report posted on the ERCOT website on September 2, 2024, generators in the study area that met Planning Guide Section 6.9(1) conditions with Commercial Operations Date (COD) prior to June 2028 were added to the study base case. These generation additions are listed in Table 2.3. All generation dispatches were consistent with the 2024 RTP methodology.

Table 2.3: List of Generation Added to the Study Base Case Based on the August 2024 GIS Report

GINR	Project Name	Fuel	Project COD	Max Capacity (~MW)	County
19INR0110	Azalea Springs Solar	SOL	05/31/2025	181.0	Angelina
20INR0203	Pine Forest Solar	SOL	12/01/2025	301.5	Hopkins
20INR0208	Signal Solar	SOL	03/15/2025	51.8	Hunt
20INR0222	Tyson Nick Solar	SOL	08/01/2025	90.5	Lamar
21INR0240	La Casa Wind	WIN	03/22/2025	148.4	Stephens
21INR0368	Eliza Solar	SOL	12/20/2024	151.7	Kaufman
21INR0379	Ash Creek Solar	SOL	01/31/2025	417.7	Hill
21INR0511	Wolf Ridge Repower	WIN	08/31/2024	9.0	Cooke
21INR0515	Roadrunner Crossing Wind II SLF	WIN	10/31/2024	126.7	Eastland
22INR0260	Eliza Storage	OTH	02/17/2025	100.4	Kaufman
22INR0526	Pine Forest BESS	OTH	10/29/2025	210.1	Hopkins
22INR0554	Platinum Storage	OTH	03/03/2025	309.5	Fannin
22INR0555	TE Smith Storage	OTH	07/15/2025	125.4	Rockwall
23INR0026	Baker Branch Solar	SOL	09/30/2024	469.4	Lamar
23INR0030	Langer Solar	SOL	03/01/2027	249.8	Bosque
23INR0070	Chillingham Solar	SOL	10/18/2024	352.4	Bell
23INR0114	True North Solar	SOL	12/05/2024	238.8	Falls
23INR0118	Blevins Solar	SOL	07/01/2025	271.6	Falls
23INR0119	Blevins Storage	OTH	07/01/2025	181.3	Falls
23INR0195	Desert Willow BESS	OTH	02/03/2025	154.4	Ellis
23INR0296	Trojan Solar SLF	SOL	02/28/2026	153.0	Cooke

[3] GIS Report: https://www.ercot.com/misapp/GetReports.do?reportTypeId=15933

GINR	Project Name	Fuel	Project COD	Max Capacity (~MW)	County
23INR0299	Anole BESS	OTH	05/30/2025	247.1	Dallas
23INR0349	Tokio Solar	SOL	08/25/2025	170.5	McLennan
23INR0367	Fewell Solar	SOL	09/09/2025	203.5	Limestone
23INR0403	Connolly Storage	OTH	09/06/2024	125.4	Wise
23INR0469	Big Elm Storage	OTH	11/10/2025	100.8	Bell
24INR0010	Pinnington Solar	SOL	10/15/2025	666.1	Jack
24INR0015	Five Wells Solar	SOL	09/15/2024	322.8	Bell
24INR0023	Compadre Solar	SOL	12/25/2024	406.1	Hill
24INR0038	SP Jaguar Solar	SOL	06/01/2026	300.0	McLennan
24INR0039	SP Jaguar BESS	OTH	06/30/2025	314.3	McLennan
24INR0138	Midpoint Storage	OTH	08/30/2025	51.3	Hill
24INR0139	Midpoint Solar	SOL	08/30/2025	99.8	Hill
24INR0140	Gaia Storage	OTH	07/31/2025	76.8	Navarro
24INR0141	Gaia Solar	SOL	07/31/2025	152.7	Navarro
24INR0198	Two Forks BESS	OTH	07/01/2027	309.0	Cooke
24INR0295	Lucky Bluff BESS SLF	OTH	10/15/2025	100.8	Erath
24INR0312	Wigeon Whistle BESS	OTH	09/23/2024	122.9	Collin
24INR0315	Black Springs BESS SLF	OTH	10/15/2025	120.7	Palo Pinto
24INR0631	Radian Storage SLF	OTH	12/31/2024	160.3	Brown
25INR0105	Diver Solar SLF	SOL	06/30/2026	225.6	Limestone
25INR0231	Apache Hill BESS	OTH	11/15/2026	201.2	Hood

The status of each unit that was projected to be either indefinitely mothballed or retired at the time of the study was reviewed. The units listed in Table 2.4 were opened (turned off) in the study base case to reflect their mothballed/retired status.

Table 2.4: List of Generation Opened to Reflect Mothballed/Retired/Forced Outage Status

Bus No	Unit Name	Max Capacity (~MW)	Weather Zone
110941	SL_SL_G1	65.0	Coast
110942	SL_SL_G2	65.0	Coast
110943	SL_SL_G3	30.0	Coast
110944	SL_SL_G4	30.0	Coast
140042	WFCOGEN_UNIT2	17.0	North
130121	SGMTN_SIGNALM2	6.6	Far West
132931	TOSBATT_UNIT1	2.0	Far West

Generation listed in Table 2.5 were closed (turned on) in the study base case to reflect the change in their Generation Resource as these resources are returning to year-round service.

Table 2.5: List of Generation Closed to Reflect Returning to Service Status

Bus No	Unit Name	Max Capacity (~MW)	Weather Zone
110020	WAP_GT2	71.0	Coast

Bus No	Unit Name	Max Capacity (~MW)	Weather Zone
150023	MCSES_UNIT8	568.0	North Central
110261	TGF_TGFGT_1	78.0	Coast

2.1.4 Loads

Loads in the NNC Weather Zones were updated based on the new confirmed load by agreement contract in the study area from Oncor, shown in Table 2.6. Loads outside of NNC Weather Zones were adjusted as necessary to maintain the minimum reserve requirements consistent with the 2023 RTP methodology.

Table 2.6: New Load Added to the Study Base Case

Bus No	Substation Name	Load (MW)
3083	Wilmer	756

2.2 Long-Term Load-Serving Capability Assessment

ERCOT performed a long-term load-serving capability assessment to compare the performance of the study options.

Incremental load serving capability was evaluated to assess the long-term load-serving capability. The loads in the study area were increased (customer designated as non-scalable remained at the same level as in the study base case), and conforming loads outside of NNC Weather Zones were decreased to balance power.

2.3 Maintenance Outage Scenario

ERCOT developed an off-peak maintenance season scenario to further evaluate the study options.

The load levels in the NNC Weather Zones were reduced to 81.3% of their summer peak load levels in the study base case. This scaling is meant to reflect assumed off-peak season loads based on historical load in the NNC Weather Zones.

2.4 Study Assumptions for Congestion Analysis

Congestion analysis was conducted to identify any new congestion in the study area with the addition of the recommended transmission upgrade option.

The 2023 RTP 2028 economic case was updated based on the August 2024 GIS[4] report for generation updates and the June 2024 TPIT[5] report for transmission updates to conduct congestion analysis. The 2028 study year was selected based on the expected ISD of the full load confirmed by agreement contract.

[4] GIS Report: https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER
[5] TPIT Report: https://www.ercot.com/gridinfo/planning

New transmission projects additions are listed in Table A.1 in the Appendix A of this document. RTP projects shown in Table 2.2, that were used as placeholder projects in the study area, were removed from the economic base case.

New generation additions listed in Table A.2 in Appendix A of this document were added to the economic base case and all generation listed in Table 2.4 were opened (turned off) in the study base case to reflect their mothballed/retired status. Furthermore, generation listed in Table 2.5 were removed from seasonal settings in the study base case as these resources are returned to year-round service.

2.5 Methodology

This section lists the Contingencies and Criteria used for project review along with tools used to perform the various analyses.

2.5.1 Contingencies and Criteria

The reliability assessments were performed based on NERC Reliability Standard TPL-001-5.1, ERCOT Protocols, and ERCOT Planning Criteria.[6]

Contingencies[7] were updated based on the changes made to the topology as described in Section 2.1 of this document. The following steady-state contingencies were simulated for the study region:

- P0 (System Intact);
- P1, P2-1, P7 (N-1 conditions);
- P2-2, P2-3, P4, and P5 (345-kV only);
- P3: G-1+N-1 (G-1: generation outage) {Forney Energy Center CC Train 1}; and
- P6-2: X-1+N-1 (X-1: 345/138-kV transformer only) {Watermill T2, Seagoville T1, and Forney T2}.

All 69-kV and above buses, transmission lines, and transformers in the study region were monitored (excluding generator step-up transformers) and the following thermal and voltage limits were enforced:

- Thermal limits
  - Rate A (normal rating) for pre-contingency conditions; and
  - Rate B (emergency rating) for post-contingency conditions.
- Voltage limits
  - Voltages exceeding pre-contingency and post-contingency limits; and
  - Voltage deviations exceeding 8% on non-radial load buses.

2.5.2 Study Tools

ERCOT utilized the following software tools to perform this independent study:

[6] ERCOT Planning Criteria: http://www.ercot.com/mktrules/guides/planning/current
[7] Details of each event and contingency category is defined in the NERC Reliability Standard TPL-001-5.1

- PowerWorld Simulator version 23 for Security Constrained Optimal Power Flow (SCOPF) and steady-state contingency analysis; and
- UPLAN version 12.3.0.29978 to perform congestion analysis.

3 Project Need

Steady-state reliability analysis was performed in accordance with NERC TPL-001-5.1 and ERCOT Planning Criteria described in Section 2.1 of this document. This analysis indicated thermal overloads in the Dallas and neighboring counties as seen in the Oncor project submission as well as additional unsolvable contingencies and voltage violations under NERC P1 (N-1) and P6-2 (X-1+N-1) in the study area. These issues are summarized in Table 3.1 and visually illustrated in the Figure 3.1. Detailed thermal overloads and voltage violations are listed in Table 3.2 and Table 3.3 respectively.

Table 3.1: Reliability Issues Seen Under NERC TPL-001-5.1 and ERCOT Planning Criteria in the Study Area

NERC Contingency Category	Voltage Violations	Thermal Overloads	Unsolved Power Flow
P0: N-0	None	None	None
P1, P2-1, P7: N-1	6	8	None
P3: G-1+N-1	None	None	None
P6-2: X-1+N-1	11	3	2

Table 3.2: Thermal Overloads Observed in the Study Area

NERC Contingency Category	Overloaded Element	Voltage Level (kV)	Length (~miles)	Max Loading (%)
P1: N-1	Kleberg Tap – Southside Filtration Tap East	138	4.8	122.4
P1: N-1	Seagoville – Kleberg Tap	138	2.7	126.5
P1: N-1	Seagoville Transformer	345/138	0.0	137.8
P1: N-1	Seagoville Switch – Seagoville	138	0.2	129.7
P1: N-1	Southside Filtration Tap East – Wilmer	138	3.3	122.1
P1: N-1	Watermill Switch – Wimer	138	4.8	122.7
P1: N-1	Windham Road – Waxahachie Ocf	69	3.9	109.7
P1: N-1	Watermill Transformer	345/138	0.0	101.0
P6-2: X-1+N-1	Crandall – Forney	138	5.3	103.4
P6-2: X-1+N-1	Kaufman Northwest – Forney	138	8.2	105.4
P6-2: X-1+N-1	Waxahachie – Waxahachie Ocf	69	6.8	100.4

Table 3.3: Voltage Violations Observed in the Study Area

NERC Contingency Category	Bus Name	Voltage Level (kV)	Voltage (pu)
P1: N-1	Wilmer	138	0.82
P1: N-1	Southside Filtration	138	0.86
P1: N-1	Southside Filtration Tap East	138	0.86
P1: N-1	Kleberg (Oncor)	138	0.9

NERC Contingency Category	Bus Name	Voltage Level (kV)	Voltage (pu)
P1: N-1	Seagoville	138	0.9
P1: N-1	Kleberg Tap	138	0.9
P6-2: X-1+N-1	Eastside Filtration	138	0.88
P6-2: X-1+N-1	Larkin Road	138	0.88
P6-2: X-1+N-1	Eastside Filtration	138	0.88
P6-2: X-1+N-1	Eastside Filt Pump South	138	0.88
P6-2: X-1+N-1	Mesquite	138	0.88
P6-2: X-1+N-1	Mesquite	138	0.88
P6-2: X-1+N-1	Balch Springs	138	0.88
P6-2: X-1+N-1	Vanguard Sub	138	0.88
P6-2: X-1+N-1	Lawson Road	138	0.88
P6-2: X-1+N-1	Seagoville	138	0.89
P6-2: X-1+N-1	Seagoville Switch	138	0.89

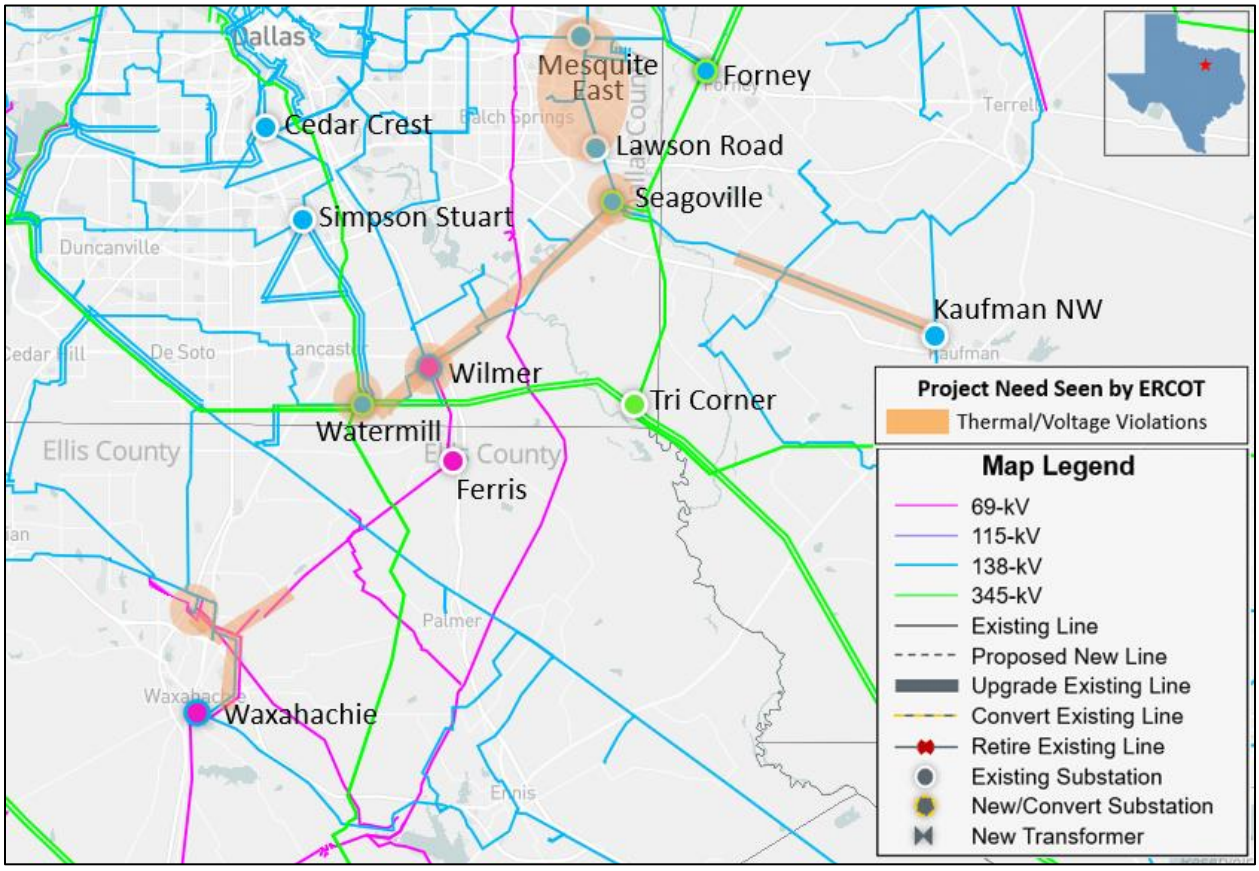

Figure 3.1: Study Area Map Showing Project Need Seen by ERCOT

4 Description of Project Options

ERCOT evaluated four system improvement options to address the reliability violations observed in the study base case in the study area.

4.1.1 Option 1

Option 1 (Oncor proposed solution) consists of the following:

- Expand the existing Wilmer 138-kV substation to establish the new Wilmer 345/138-kV switchyard by installing eight 345-kV, 5000 A breakers and fifteen 138-kV, 3200 A breakers in breaker-and-a-half bus arrangements.
    - Install two 345/138-kV autotransformers with normal and emergency ratings of at least 700 MVA and 750 MVA each.
    - Install two 110.4 MVAr (in three 36.8 MVAr stages) 138-kV capacitor banks.
- Rebuild portion of the existing Watermill Switch to Tri Corner Switch 345-kV double-circuit transmission line with two separate double-circuit structures starting from Watermill Switch to structure number 102/3, utilizing the existing ROW using a conductor with a normal and emergency rating of at least 2988 MVA, approximately 2.4-mile.
- Install two new 345-kV circuits from Watermill Switch to Wilmer Switch on each of the existing Watermill Switch to Tri Corner Switch 345-kV double-circuit structures using a conductor with a normal and emergency rating of at least 2988 MVA, 1.4-mile of the approximately 3.8-mile circuits will require new ROW.
- Terminate the existing Lavender Switch to Parkdale Switch 138-kV transmission line to the Wilmer 138-kV switch.
- Rebuild the existing Watermill Switch to Lavender Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 3.1-mile.
- Rebuild the existing Lavender Switch to Wilmer Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 1.2-mile.
- Convert the existing Wilmer Switch to Ferris Switch 69-kV transmission line to 138-kV operation with a normal and emergency rating of at least 764 MVA, approximately 4.0-mile.
- Relocate the existing Wilmer 138/69-kV autotransformer to the existing Ferris 69-kV switch.
- Ensure all transmission line terminal and associated equipment elements are rated to meet or exceed 5000 A for 345-kV and 3200 A for 138-kV.

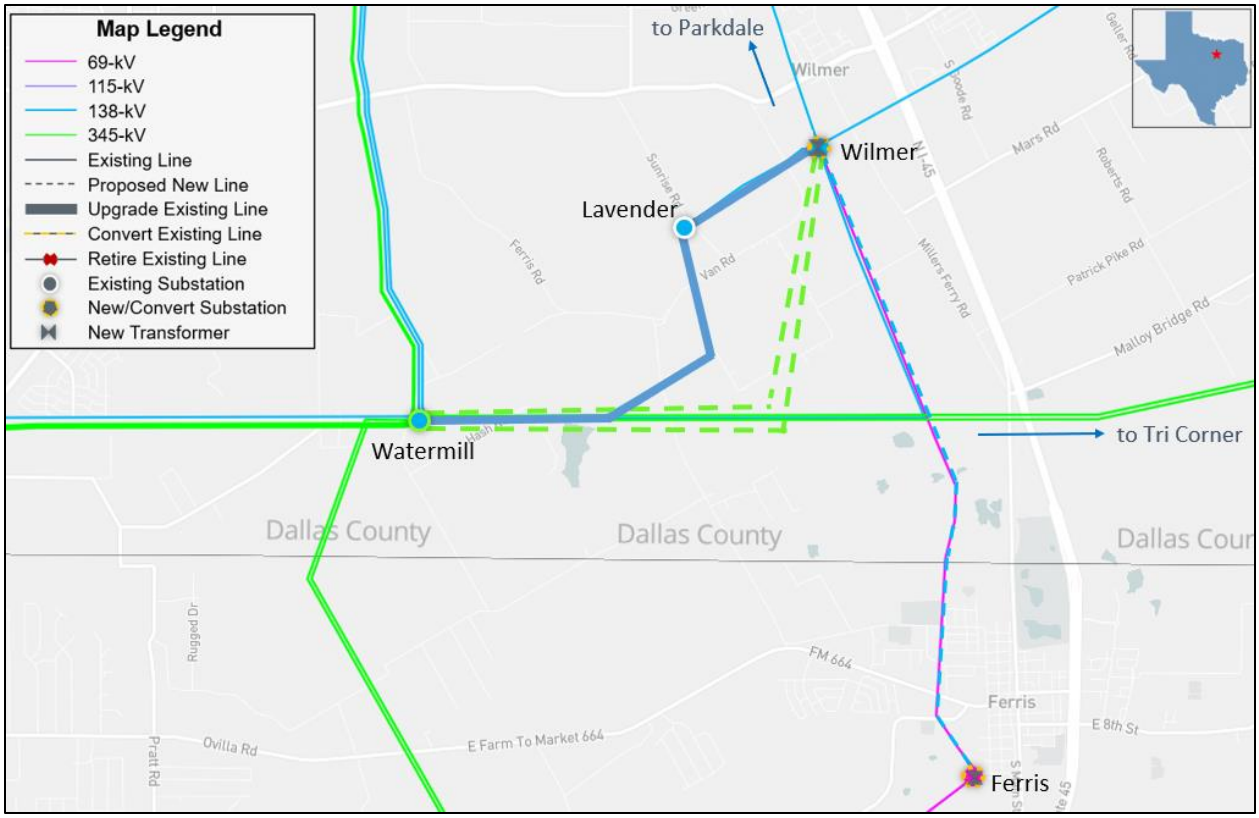

Figure 4.1: Map of Option 1

4.1.2 Option 2

Option 2 consists of the following:

- Expand the existing Wilmer 138-kV substation to establish the new Wilmer 345/138-kV switchyard by installing eight 345-kV, 5000 A breakers and fifteen 138-kV, 3200 A breakers in breaker-and-a-half bus arrangements.
    - Install two 345/138-kV autotransformers with normal and emergency ratings of at least 700 MVA and 750 MVA each.
    - Install two 110.4 MVAr (in three 36.8 MVAr stages) 138-kV capacitor banks.
- Construct a new single-circuit 345-kV line to loop the existing Watermill Switch to Tri Corner Switch 345-kV north circuit into the new Wilmer 345/138-kV switchyard, approximately 3.4-mile.
- Terminate the existing Lavender Switch to Parkdale Switch 138-kV line to the Wilmer 138-kV switch.
- Rebuild the existing Watermill Switch to Lavender Switch 138-kV line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 3.1-mile.
- Rebuild the existing Lavender Switch to Wilmer Switch 138-kV line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 1.2-mile.

- Convert the existing Wilmer Switch to Ferris Switch 69-kV line to 138-kV operation with a normal and emergency rating of at least 764 MVA, approximately 4.0-mile.
- Relocate the existing Wilmer 138/69-kV autotransformer to the existing Ferris 69-kV switch.
- Ensure all line terminal and associated equipment elements are rated to meet or exceed 5000 A for 345-kV and 3200 A for 138-kV.

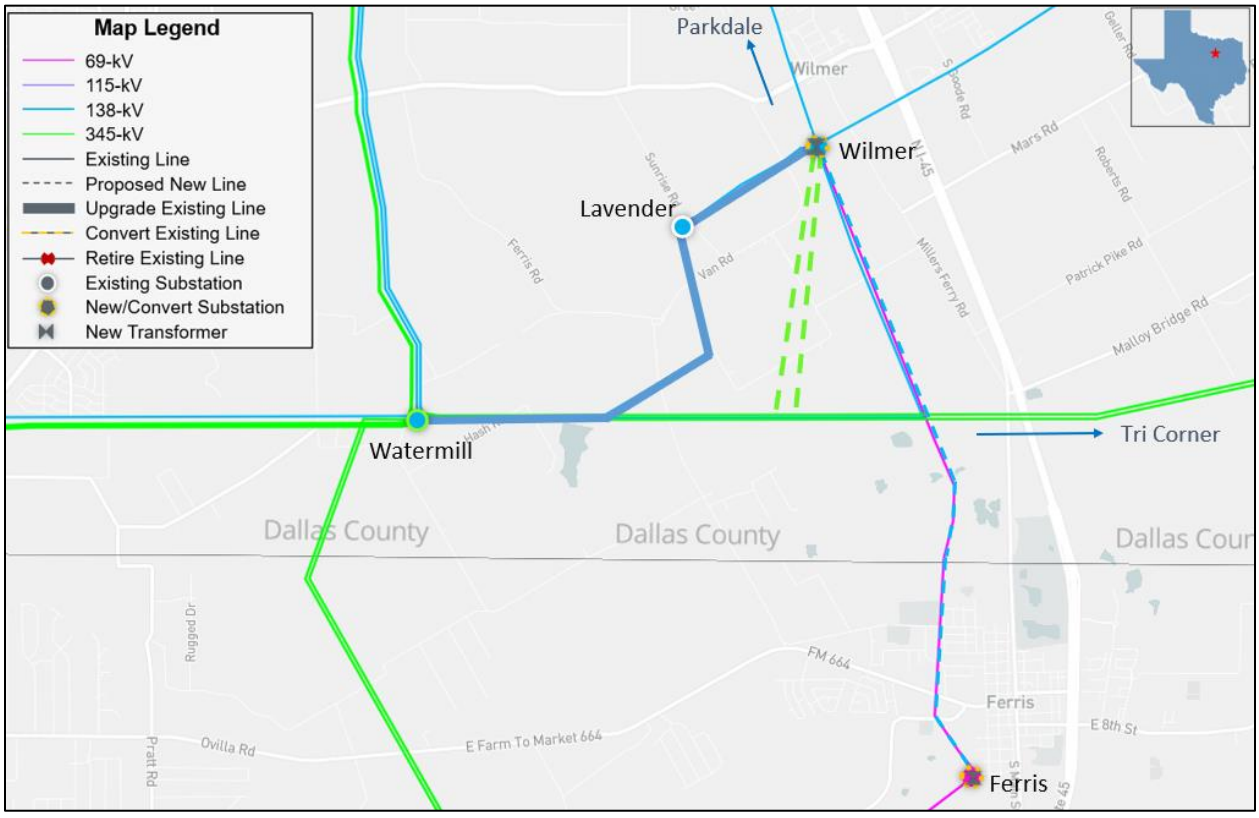

Figure 4.2: Map of Option 2

4.1.3 Option 3

Option 3 consists of the following:

- Expand the existing Wilmer 138-kV substation to establish the new Wilmer 345/138-kV switchyard by installing eight 345-kV, 5000 A breakers and fifteen 138-kV, 3200 A breakers in breaker-and-a-half bus arrangements.
    - Install two 345/138-kV autotransformers with normal and emergency ratings of at least 700 MVA and 750 MVA each.
    - Install two 110.4 MVAr (in three 36.8 MVAr stages) 138-kV capacitor banks.
- Construct a new single-circuit 345-kV line to loop the existing Watermill Switch to West Levee Switch 345-kV line into the new Wilmer 345/138-kV switchyard, approximately 6.5-mile.
- Terminate the existing Lavender Switch to Parkdale Switch 138-kV transmission line to the Wilmer 138-kV switch.

- Rebuild the existing Watermill Switch to Lavender Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 3.1-mile.
- Rebuild the existing Lavender Switch to Wilmer Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 1.2-mile.
- Convert the existing Wilmer Switch to Ferris Switch 69-kV transmission line to 138-kV operation with a normal and emergency rating of at least 764 MVA, approximately 4.0-mile.
- Relocate the existing Wilmer 138/69-kV autotransformer to the existing Ferris 69-kV switch.
- Ensure all line terminal and associated equipment elements are rated to meet or exceed 5000 A for 345-kV and 3200 A for 138-kV.

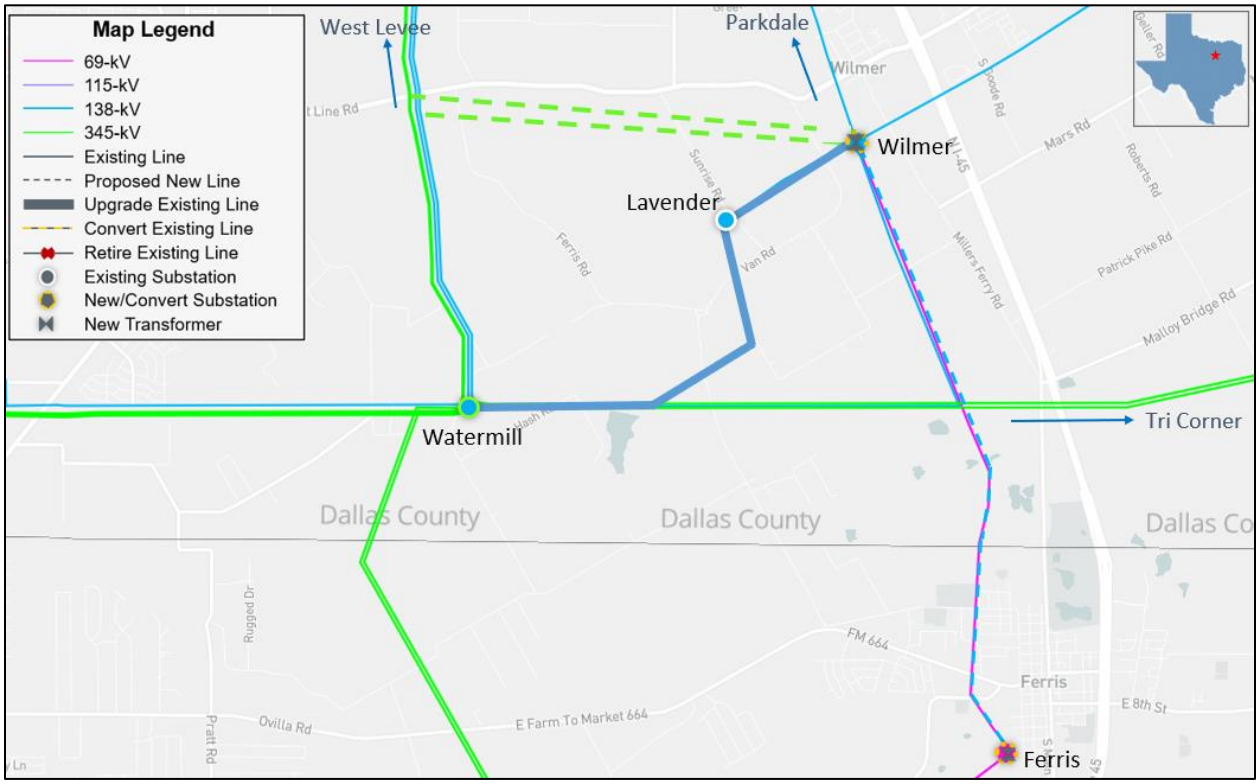

Figure 4.3: Map of Option 3

4.1.4 Option 4

Option 4 consists of the following:

- Expand the existing Wilmer 138-kV substation to establish the new Wilmer 345/138-kV switchyard by installing eight 345-kV, 5000 A breakers and fifteen 138-kV, 3200 A breakers in breaker-and-a-half bus arrangements.
    - Install two 345/138-kV autotransformers with normal and emergency ratings of at least 700 MVA and 750 MVA each.
    - Install two 110.4 MVAr (in three 36.8 MVAr stages) 138-kV capacitor banks.
- Rebuild portion of the existing Watermill Switch to Tri Corner Switch 345-kV double-circuit transmission line with two separate double-circuit structures starting from Watermill Switch to

structure number 102/3, utilizing the existing ROW using a conductor with a normal and emergency rating of at least 2988 MVA, approximately 2.4-mile.

- Install one new 345-kV circuit from Watermill Switch to Wilmer Switch on one of the existing Watermill Switch to Tri Corner Switch 345-kV double-circuit structures using a conductor with a normal and emergency rating of at least 2988 MVA, 1.4-mile of the approximately 3.8-mile circuit will require new ROW.
- Construct a new Wilmer Switch to Tri Corner Switch 345-kV single-circuit line, approximately 10.8-mile.
- Terminate the existing Lavender Switch to Parkdale Switch 138-kV transmission line to the Wilmer 138-kV switch.
- Rebuild the existing Watermill Switch to Lavender Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 3.1-mile.
- Rebuild the existing Lavender Switch to Wilmer Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 1.2-mile.
- Convert the existing Wilmer Switch to Ferris Switch 69-kV transmission line to 138-kV operation with a normal and emergency rating of at least 764 MVA, approximately 4.0-mile.
- Relocate the existing Wilmer 138/69-kV autotransformer to the existing Ferris 69-kV switch.
- Ensure all line terminal and associated equipment elements are rated to meet or exceed 5000 A for 345-kV and 3200 A for 138-kV.

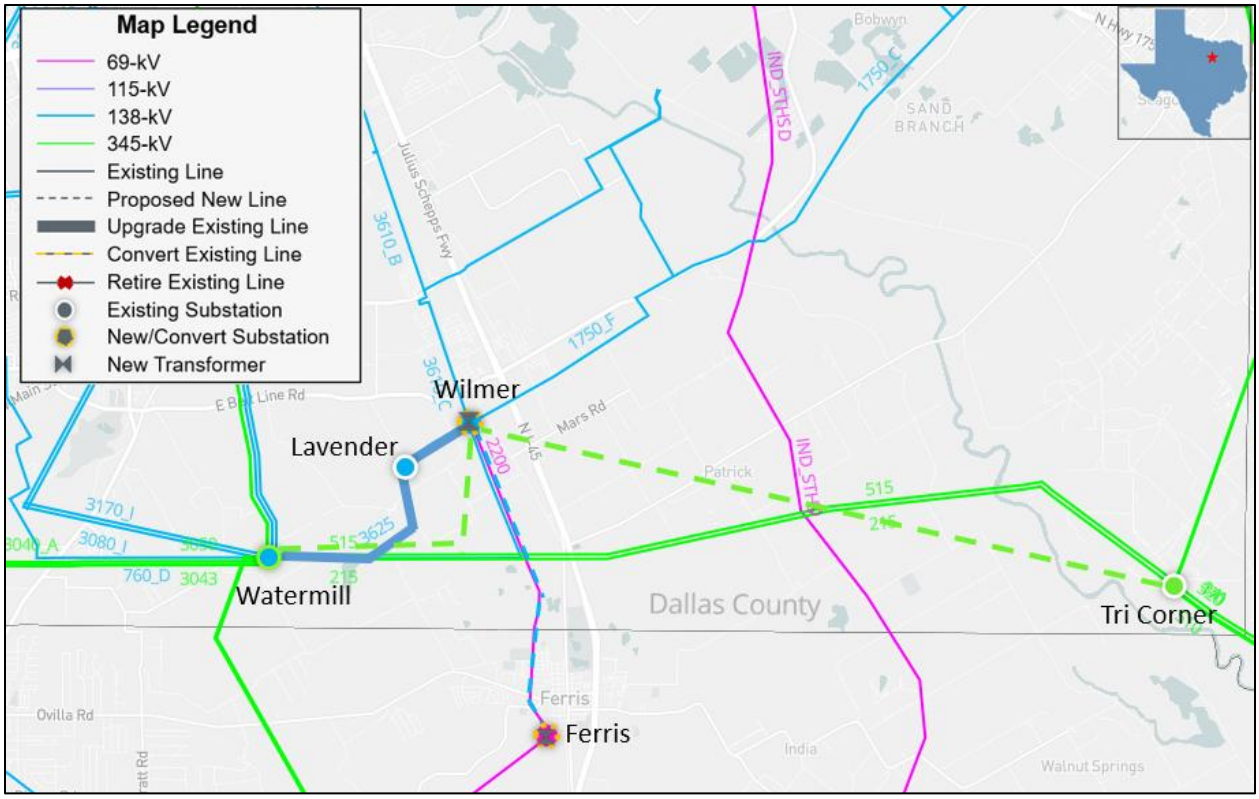

Figure 4.4: Map of Option 4

5 Option Evaluations

ERCOT performed a reliability analysis to evaluate all four options and to identify any reliability impacts of the options in the study area. Bason on the results of these analyses, short-listed options were selected for further evaluations of planned maintenance outage evaluation and long-term load-serving capability assessment. This section details these studies and their results and compares the short-listed options.

5.1 Results of Reliability Analysis

All four options were evaluated based on the contingencies described in the Section 2.1 of this report. Both Option 2 and Option 3 observed thermal overloads under X-1+N-1 contingency conditions. No reliability criteria violations were identified for Option 1 and Option 4 under N-1, X-1+N-1, or G-1+N-1 as shown in Table 5.1.

Table 5.1: Results of Initial Reliability Assessment of All Four Options

Option	N-1			X-1+N-1		G-1+N-1	
	Unsolved Power Flow	Thermal Overload	Voltage Violation	Thermal Overload	Voltage Violation	Thermal Overload	Voltage Violation
1	None	None	None	None	None	None	None
2	None	None	None	1	None	None	None
3	None	None	None	1	None	None	None
4	None	None	None	None	None	None	None

5.2 Short-Listed Options

Based on the results shown in Section 5.1, Option 1 and Option 4 were selected as short-listed options for further evaluations. These two options are illustrated in Figures 5.1 and 5.2.

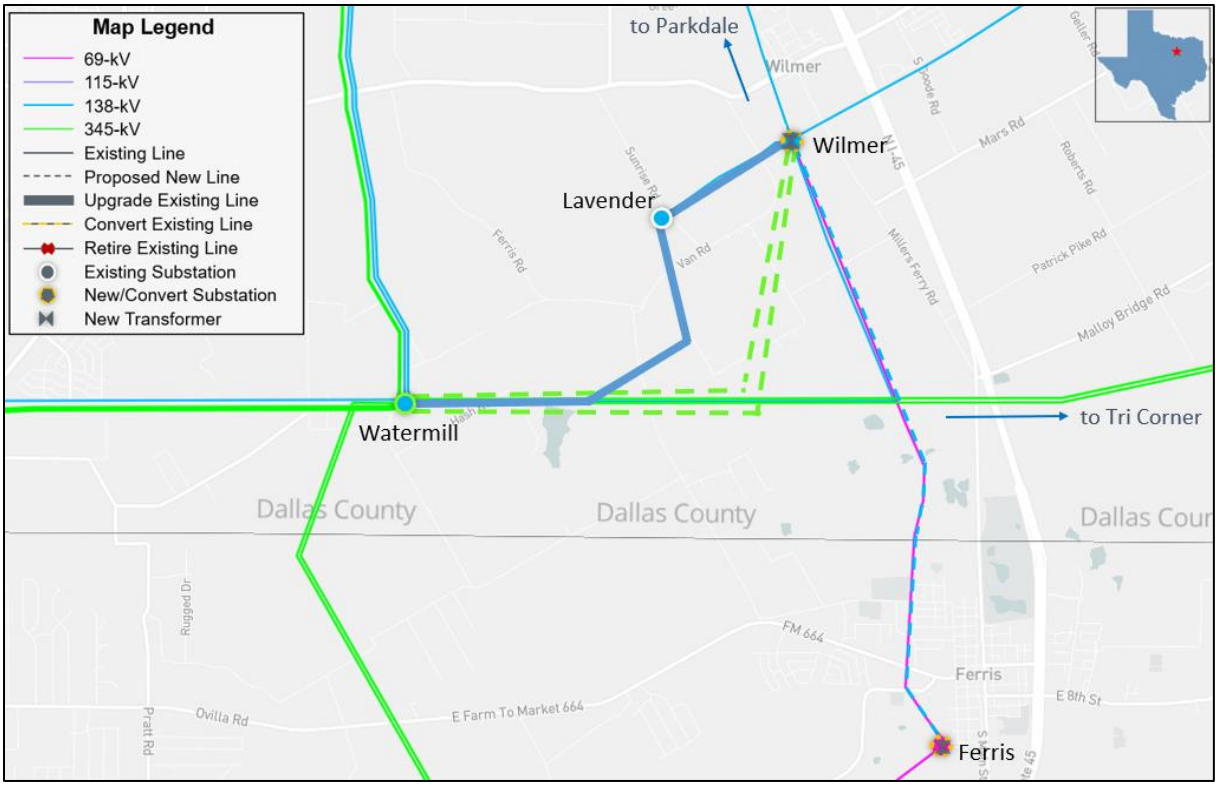

Figure 5.1: Map of Option 1

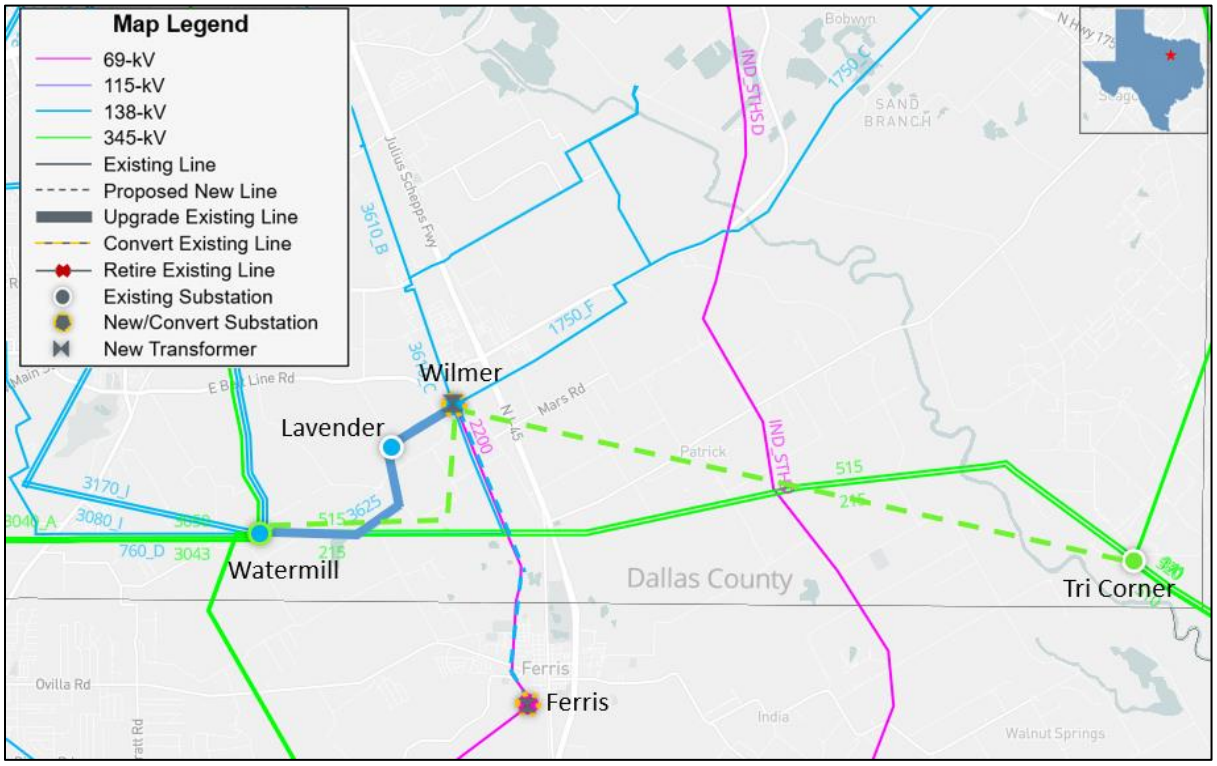

Figure 5.2: Map of Option 4

5.3 Long-Term Load-Serving Capability Assessment

ERCOT performed a long-term load-serving capability assessment for Option 1 and Option 4 to compare the relative performance between the two short-listed options.

The results in Table 5.2 show that Option 1 has approximately 200 MW more incremental load-serving capability than Option 4.

Table 5.2: Results of Long-Term Load-Serving Capability Assessment of the Short-Listed Options

Option	Incremental Load-Serving Capability (~MW)
1	831
4	627

5.4 Planned Maintenance Outage Evaluation

Using the P1, P2.1, and P7 contingencies based on the review of the system topology of the area, ERCOT conducted an N-2 contingency analysis for Option 1 and Option 4 to represent system element outage(s) under planned maintenance condition (N-1-1) in the area. Then, each N-2 violation was run as an N-1-1 contingency scenario, with system adjustments between the contingencies. The transmission elements in the study area were monitored in the maintenance outage evaluation.

Initially, the 2023 RTP placeholder project of Waxahachie Area 69-kV and 138-kV Line Upgrades (2023-NC42) listed in Table 2.2 of Section 2.1.2 was removed from this Independent Review. For the planned maintenance outage evaluation, reliability violations were observed in the Waxahachie area which is independent of this Wilmer 345/138-kV Switch Project. As such, this placeholder project of Waxahachie Area 69-kV and 138-kV Line Upgrades was included in the planned maintenance outage evaluation. Oncor is working on addressing this issue in the Waxahachie Area.

As shown in Table 5.3, the results of this planned maintenance assessment indicate the short-listed options did not result in any reliability violations.

Table 5.3: Results of Planned Maintenance Outage Evaluation for the Short-Listed Options

Option	Voltage Violations	Thermal Violations	Unsolved Power Flow
1	None	None	None
4	None	None	None

5.5 Cost Estimate and Feasibility Assessment

Oncor performed feasibility assessments and provided final cost estimates for the two short-listed options. Table 5.4 summarizes the cost estimate, estimated mileage of Certificate of Convenience and Necessity (CCN) required, and option feasibility for the two short-listed options.

Table 5.4: Cost Estimates and Expected ISD for the Short-Listed Options

Option	Cost Estimates (~$M)	CCN Required (~miles)	Feasible
1	158.2	Yes (3.8)	Feasible

Option	Cost Estimates (~$M)	CCN Required (~miles)	Feasible
4	198.6	Yes (14.6)	Feasible

6 Comparison of Short-Listed Options

Based on the results from Option Evaluations in Section 5, both short-listed Option 1 and Option 4 are summarized in Table 6.1.

Table 6.1: Comparison of the Short-Listed Options

	Option 1	Option 4
Addresses the project needs	Yes	Yes
Meets ERCOT and NERC Reliability Criteria	Yes	Yes
Improves Long-Term Load-Serving Capability	Yes (Better)	Yes
CCN Required (~miles)	Yes (3.8)	Yes (14.6)
Construction Feasibility (Based on TSP assessment)	Yes	Yes
Capital Cost Estimates[8] (~$M)	158.2	198.6

ERCOT recommends Option 1 as the preferred option to address the reliability need in the study area based on the following considerations:

- Option 1 addresses project need in the study area;
- Option 1 improves long-term load-serving capability for future load growth in the area; and
- Option 1 is the least cost solution and requires least amount of CCN mileages.

7 Additional Analysis and Assessment

The recommended option (Option 1, with a cost estimate of approximately $158.2 million) is categorized as a Tier 1 project, pursuant to ERCOT Protocol 3.11.4.3(1)(a). ERCOT performed generation and load sensitivity studies to identify the recommended option performance, as required under Planning Guide Section 3.1.3(4). Additionally, a Sub-synchronous Resonance (SSR) Assessment was performed.

7.1 Generation Addition Sensitivity Analysis

ERCOT performed a generation addition sensitivity analysis based on Planning Guide Section 3.1.3(4)(a).

Based on a review of the October 2024 GIS[9] report, nine units were found within the study area that could have an impact on the identified reliability issues. These units, listed in the Table 7.1, were added to the recommended option case following 2024 RTP Methodology. ERCOT determined addition of these generators do not impact the recommended option.

[8] The cost estimates were provided by the TSPs.
[9] GIS Report: https://www.ercot.com/mp/data-products/data-product-details?id=PG7-200-ER

Table 7.1: List of Units that Could Have Impact on the Identified Reliability Issues

GINR	Unit Name	Fuel Type	Max Capacity (~MW)	County
21INR0362	Oystercatcher Solar	SOL	220.3	Ellis
21INR0421	Armadillo Solar	SOL	200.1	Navarro
22INR0437	TORMES SOLAR	SOL	382.1	Navarro
24INR0206	Glasgow Solar	SOL	203.5	Navarro
24INR0207	Glasgow Storage	OTH	101.0	Navarro
24INR0303	Erika Solar	SOL	204.1	Kaufman
24INR0355	Anatole Renewable Energy Storage	OTH	207.8	Henderson
24INR0472	Amador Storage	OTH	102.6	Van Zandt
25INR0018	Yellow Cat Wind	WIN	300.0	Navarro

7.2 Load Scaling Sensitivity Analysis

Planning Guide Section 3.1.3(4)(b) requires an evaluation of the potential impact of load scaling on the criteria violations seen in this ERCOT independent review. As stated in Section 2.1, ERCOT used the 2028 NNC summer peak case from the 2023 RTP and adjusted the load to create the 2028 NNC summer peak case to study the Dallas County area. This study base case, which was created in accordance with the 2023 RTP Study Scope and Process document and Section 2.1 of this document, included load scaled down from the respective non-coincident peaks in the Coast, East, Far West, South, South Central, and West Weather Zones.

The Outage Transfer Distribution Factors (OTDFs) of overloaded elements with respect to the load transfer for each Weather Zone (excluding North and North Central) were calculated using PowerWorld Simulator. The OTDFs were less than 1% for each of the overloaded elements, i.e., they were not significant enough to have an impact on the overloaded elements. ERCOT concluded that the load scaling used to develop the base case in this study did not have a material impact on the project need, which was primarily driven by reliability issues in the Dallas County area.

7.3 Sub-synchronous Resonance (SSR) Assessment

Pursuant to Protocol Section 3.22.1.3(2), ERCOT conducted a SSR screening for the recommended option (Option 1) and found no adverse SSR impacts to the existing and planned generation resources in the study area.

8 Congestion Analysis

ERCOT conducted a congestion analysis to identify any potential impact on system congestion related to the addition of the recommended option (Option 1) using the 2023 RTP 2028 economic study case, using the study assumptions identified in Section 2.4 of this document.

The results of congestion analysis indicated no additional congestion in the study area due to the addition of the recommended project of Option 1.

9 Conclusion

ERCOT evaluated four transmission upgrade options to resolve the thermal overloads and voltage violations identified in the study area. Based on the results of the independent review, ERCOT recommends Option 1 as the preferred solution because it addresses all project needs, is the least cost option with no reliability violations, and improves long-term load-serving capability.

Option 1 (Oncor proposed solution) consists of the following upgrades:

- Expand the existing Wilmer 138-kV substation to establish the new Wilmer 345/138-kV switchyard by installing eight 345-kV, 5000 A breakers and fifteen 138-kV, 3200 A breakers in breaker-and-a-half bus arrangements.
    - Install two 345/138-kV autotransformers with normal and emergency ratings of at least 700 MVA and 750 MVA each.
    - Install two 110.4 MVAr (in three 36.8 MVAr stages) 138-kV capacitor banks.
- Rebuild portion of the existing Watermill Switch to Tri Corner Switch 345-kV double-circuit transmission line with two separate double-circuit structures starting from Watermill Switch to structure number 102/3, utilizing the existing ROW using a conductor with a normal and emergency rating of at least 2988 MVA, approximately 2.4-mile.
- Install two new 345-kV circuits from Watermill Switch to Wilmer Switch on each of the existing Watermill Switch to Tri Corner Switch 345-kV double-circuit structures using a conductor with a normal and emergency rating of at least 2988 MVA, 1.4-mile of the approximately 3.8-mile circuits will require new ROW.
- Terminate the existing Lavender Switch to Parkdale Switch 138-kV transmission line to the Wilmer 138-kV switch.
- Rebuild the existing Watermill Switch to Lavender Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 3.1-mile.
- Rebuild the existing Lavender Switch to Wilmer Switch 138-kV transmission line using a conductor with a normal and emergency rating of at least 764 MVA, approximately 1.2-mile.
- Convert the existing Wilmer Switch to Ferris Switch 69-kV transmission line to 138-kV operation with a normal and emergency rating of at least 764 MVA, approximately 4.0-mile.
- Relocate the existing Wilmer 138/69-kV autotransformer to the existing Ferris 69-kV switch.
- Ensure all transmission line terminal and associated equipment elements are rated to meet or exceed 5000 A for 345-kV and 3200 A for 138-kV.

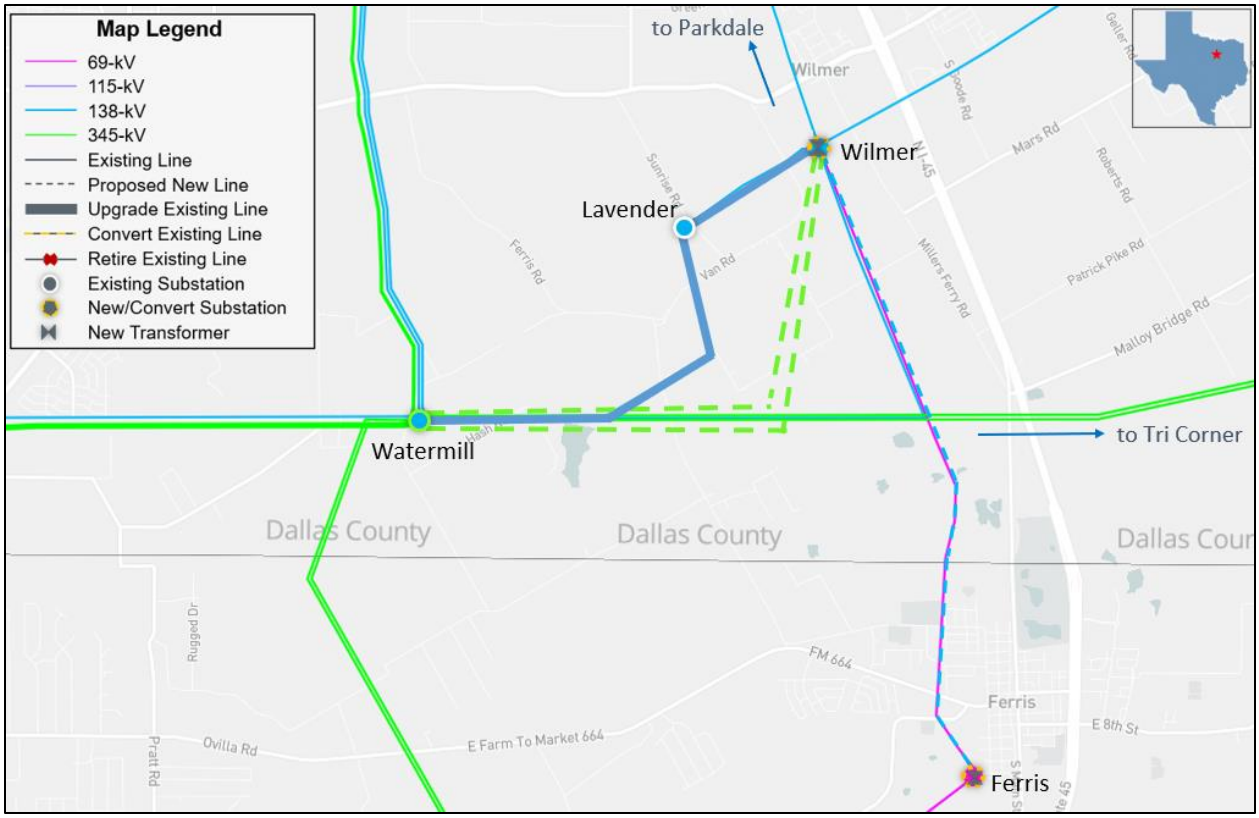

Figure 9.1: Map of Option 1

The cost estimate for this project is approximately $158.2 million and is classified as Tier 1 project per ERCOT Protocol Section 3.11.4.3(1)(a). The project is recommended for construction to meet a May 2026 ISD. However, Oncor has advised that the projected ISD may change based on requirements for various approvals and construction progress.

A CCN application will be required for the new 345-kV transmission lines from Watermill Switch – Wilmer Switch. Oncor will work with ERCOT as early as practical to develop outage plans needed for construction and implement Constraint Management Plans (CMP) based on expected operational conditions for the time period when construction outages are planned.

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Appendix A

Table A.1: List of Transmission Projects added to the Economic Base Case

TPIT/RPG No	Project Name	Tier	Project ISD	County
67992	CPSE_345KV_Howard_Switching_Station_ALL	Tier 3	2/1/2024	Bexar
71871	CPSE_Cagnon to Shepherd Rd Rebuild Phase A	Tier 4	5/1/2023	Bexar
67329	STEC_67329_Cruce-SanMiguel	Tier 1	6/1/2027	Bexar, Atascosa
23RPG024	Big Foot to Dilley Switch 138-kV Conversion Project	Tier 4	8/30/2026	Frio
73063	AEP_TCC_BigFoot_LytleConversion	Tier 4	9/20/2025	Medina, Frio
67915	AEP_TCC_Asherton-West Batesville138kVLineRebuild	Tier 3	12/30/2028	Dimmit, Zavala
22RPG026	Wimberley Loop project	Tier 2	5/1/2027	Blanco, Hays
23RPG013	Silverleaf and Cowpen 345/138-kV Stations Project	Tier 1	6/1/2027	Reeves, Ward
23RPG018	Arlington Reliability Enhancement Project	Tier 2	5/1/2026	Tarrant, Dallas
23RPG023	Pecos County Transmission Improvement Projet	Tier 1	8/31/2026	Pecos
23RPG028	Rio Medina Project	Tier 2	1/1/2027	Medina
23RPG002	Hamlin to Roby 69 kV Line Rebuild Project	Tier 4	11/1/2026	Jones, Fisher
23RPG008	Fort Stockton Plant to Lynx 138-kV Line Rebuild Project	Tier 4	5/31/2025	Pecos
23RPG009	Spraberry to Polecat 138-kV Line Rebuild Project	Tier 3	Summer 2024	Midland, Glasscock
23RPG011	Morgan Creek to McDonald Road 138-kV Line Project	Tier 3	Summer 2024	Howard, Mitchell
23RPG010	Big Spring West to Stanton East 138-kV Line Rebuild Project	Tier 3	Summer 2024	Martin, Howard
23RPG014	Lamesa to Jim Payne POI to Paul Davis Tap 138-kV Line Rebuild Project	Tier 3	Summer 2024	Dawson, Martin
23RPG016	Tributary Switch – Vincent Rebuild Project	Tier 3	12/31/2024	Howard
23RPG001	Bessel to Falfurrias 138 kV Line Rebuild Project	Tier 4	4/30/2026 11/30/2026	Nueces, Kleberg, Brooks, Jim Wells
23RPG003	Eagle Ford Large Load Interconnection Project	Tier 3	12/4/2025	DeWitt
23RPG004	Lockhart to Luling 69-kV Transmission Line Overhaul Project	Tier 4	6/30/2025	Caldwell
23RPG012	Stone Lake Area Upgrades Project	Tier 3	Summer 2024 Summer 2025	Harris
23RPG015	Cuero Substation Upgrade Project	Tier 4	5/15/2024	DeWitt
23RPG017	Watermill 345/138-kV Switch Project	Tier 3	5/1/2025	Dallas
23RPG020	Hackberry Switch to DFW D East 2 138-kV Double-Circuit Line Section Project	Tier 3	12/1/2025	Dallas
23RPG021	West Columbia to Big Creek ckt 89 Reconductor Project	Tier 4	Summer 2026	Fort Bend, Brazoria
23RPG025	Britmoore to Bellaire Ckt 24 Upgrade Project	Tier 3	Summer 2025	Harris

TPIT/RPG No	Project Name	Tier	Project ISD	County
23RPG030	Walleye Creek 345/138-kV Switch Project	Tier 3	5/1/2025	Milam
23RPG031	345 kV Jeanetta Autotransformer Upgrades Project	Tier 3	Summer 2025	Harris
23RPG033	Watermill to Seagoville 138 kV Line Project	Tier 3	12/1/2025	Dallas
24RPG002	Rockhound 345/138-kV Switch and Grey Well Draw to Buffalo 2nd 138-kV Circuit Project	Tier 3	12/1/2024	Martin, Midland
24RPG005	Montfort Switch to Shankle Switch 138-kV Line Project	Tier 3	12/1/2025	Ellis, Navarro
72916	Oncor_N_NoTPIT_Geller 138 kV Substation	No TPIT	5/15/2026	Dallas
67616	ONCOR_ME_NOTPIT_Ten Mile Substation	No TPIT	5/1/2025	Dallas
60094	Convert Waco East - Elm Mott 69 kV Line to 138 kV	Tier 4	5/15/2024	McLennan
62666	Upgrade and convert McGregor - Waco West Line	Tier 4	12/15/2024	McLennan
66216	Upgrade and convert Waco West - Temple 69 kV Line to 138 kV	Tier 4	6/15/2024	McLennan, Bell
66218A	Hillsboro - Italy 69 kV Line	Tier 4	10/15/2023	Ellis
66218B	Hillsboro - Italy 69 kV Line	Tier 4	12/15/2025	Ellis
71136	Waxahachie-Waxahachie OCF 69 kV Line Rebuild	Tier 4	5/15/2025	Dallas, Ellis
71903	Establish Launch Pad 138 kV Switch	Tier 4	12/15/2025	McLennan
72916	Oncor_N_NoTPIT_Geller 138 kV Substation	No TPIT	12/15/2025	Dallas
73443	Utilize Melton POI via Navarro 345 kV Switch for Project Lefty	Tier 4	5/15/2024	Navarro
78167	Add 2nd autotransformer at Trumbull	Tier 4	11/15/2025	Ellis
78367	Montfort Switch-Shankle Switch 138 kV Line	Tier 3	12/15/2025	Navarro, Ellis
80550	Central Park 138 kV Switch	Tier 4	12/15/2024	McLennan
82304	PMCR for adding Blackjack new station	Tier 4	12/31/2024	Bosque

Table A.2: List of Generation Added to the Economic Base Case Based on August 2024 GIS Report

GINR	Venus Switch to Sam Switch 345-kV Line Project	Fuel	Project COD	Max Capacity (~MW)	County
14INR0033	Goodnight Wind	WND	2/14/2024	258.1	Armstrong
19INR0054	Monte Cristo 1 Wind	WND	9/30/2025	236.9	Hidalgo
19INR0134	Cottonwood Bayou Solar	SOL	8/13/2024	351.4	Brazoria
19INR0203	Angelo Solar	SOL	8/12/2024	195.4	Tom Green
20INR0040	Montgomery Ranch Wind	WND	9/1/2024	200.2	Foard
20INR0208	Signal Solar	SOL	3/15/2025	51.8	Hunt
20INR0210	Hopkins Solar	SOL	12/30/2023	253.1	Hopkins
20INR0248	Second Division Solar	SOL	9/17/2024	100.3	Brazoria
21INR0302	Aureola Solar	SOL	6/28/2024	203.0	Milam
21INR0303	Mandorla Solar	SOL	11/29/2024	254.0	Milam
21INR0304	Halo Solar	SOL	6/20/2024	254.0	Bell
21INR0325	Sheep Creek Wind	WND	1/31/2024	153.0	Callahan
21INR0368	Eliza Solar	SOL	11/1/2024	151.6	Kaufman
21INR0389	Hollywood Solar	SOL	6/30/2024	353.4	Wharton
21INR0424	Tierra Bonita Solar	SOL	10/29/2024	306.9	Pecos
21INR0450	Danish Fields Storage	BAT	3/6/2024	152.4	Wharton
21INR0505	Ramsey Storage	BAT	12/31/2025	510.4	Wharton
21INR0511	Wolf Ridge Repower	WND	4/2/2024	9.0	Cooke
21INR0515	Roadrunner Crossing Wind II SLF	WND	1/20/2025	126.7	Eastland
22INR0251	Shaula I Solar	SOL	10/30/2025	205.2	DeWitt
22INR0260	Eliza Storage	BAT	11/1/2024	100.2	Kaufman
22INR0261	Dorado Solar	SOL	12/31/2025	406.3	Callahan
22INR0267	Shaula II Solar	SOL	5/30/2026	205.2	DeWitt
22INR0353	BRP Carina BESS	BAT	12/31/2024	151.9	Nueces
22INR0354	XE MURAT Solar	SOL	5/13/2024	60.4	Harris
22INR0366	LIBRA BESS	BAT	1/26/2024	206.2	Guadalupe
22INR0422	Ferdinand Grid BESS	BAT	5/31/2026	202.7	Bexar
22INR0502	Shamrock	WND	4/19/2024	223.9	Crockett
22INR0555	Guevara Storage	BAT	7/15/2025	125.4	Rockwall
23INR0026	Baker Branch Solar	SOL	8/1/2024	469.4	Lamar
23INR0054	Tanglewood Solar	SOL	1/16/2025	257.0	Brazoria
23INR0062	Noria Storage	BAT	9/1/2025	75.0	Nueces
23INR0091	Cascade Solar	SOL	12/31/2024	254.2	Brazoria
23INR0114	True North Solar	SOL	6/30/2024	238.3	Falls
23INR0154	Ebony Energy Storage	BAT	5/6/2024	203.5	Comal
23INR0159	Five Wells Storage	BAT	12/30/2023	220.8	Bell
23INR0219	Dogfish BESS	BAT	12/31/2024	75.0	Pecos
23INR0239	Giga Texas Energy Storage	BAT	1/31/2024	131.1	Travis
23INR0296	Trojan Solar	SOL	2/28/2026	151.3	Cooke
23INR0331	Talitha BESS	BAT	6/30/2024	61.4	Jim Wells
23INR0349	Tokio Solar	SOL	8/25/2025	177.6	McLennan

GINR	Venus Switch to Sam Switch 345-kV Line Project	Fuel	Project COD	Max Capacity (~MW)	County
23INR0367	Fewell Solar	SOL	9/9/2025	203.5	Limestone
23INR0381	Soportar ESS	BAT	3/15/2025	102.1	Bexar
23INR0387	Pioneer DJ Wind	WND	5/3/2024	140.3	Midland
23INR0408	TECO GTG2	GAS	1/30/2024	50.0	Harris
23INR0418	Angelo Storage	BAT	5/3/2024	103.0	Tom Green
23INR0460	GULF STAR STORAGE	BAT	6/25/2024	301.0	Wharton
23INR0470	BoCo BESS	BAT	6/22/2024	155.5	Borden
23INR0525	Pyron Wind Repower	WND	2/1/2024	19.9	Nolan
23INR0637	Goodnight Wind II	WND	12/30/2024	258.3	Armstrong
24INR0010	Pinnington Solar	SOL	10/15/2025	666.1	Jack
24INR0015	Five Wells Solar	SOL	12/29/2023	322.8	Bell
24INR0038	SP Jaguar Solar	SOL	6/30/2025	300.0	McLennan
24INR0039	SP Jaguar BESS	BAT	6/30/2025	300.0	McLennan
24INR0070	Sypert Branch Solar Project	SOL	6/1/2025	261.8	Milam
24INR0100	Sheep Creek Storage	BAT	7/1/2024	142.1	Callahan
24INR0109	Oriana BESS	BAT	7/2/2025	60.3	Victoria
24INR0138	Midpoint Storage	BAT	8/30/2025	52.2	Hill
24INR0139	Midpoint Solar	SOL	8/30/2025	103.8	Hill
24INR0140	Gaia Storage	BAT	7/31/2025	76.8	Navarro
24INR0141	Gaia Solar	SOL	7/31/2025	152.7	Navarro
24INR0265	Ironman BESS	BAT	11/1/2024	304.2	Brazoria
24INR0273	Al Pastor BESS	BAT	8/16/2024	103.1	Dawson
24INR0281	Red Egret BESS	BAT	6/1/2025	310.6	Galveston
24INR0295	Lucky Bluff BESS	BAT	5/31/2025	100.8	Erath
24INR0312	Wigeon Whistle BESS	BAT	9/1/2024	122.9	Collin
24INR0337	Eldora Solar	SOL	6/30/2026	200.9	Matagorda
24INR0338	Eldora BESS	BAT	6/30/2026	201.3	Matagorda
24INR0436	Carambola BESS	BAT	5/31/2026	97.4	Hidalgo
25INR0105	Diver Solar	SOL	6/30/2026	228.2	Limestone
25INR0162	SOHO II BESS	BAT	1/1/2025	206.3	Brazoria
25INR0223	Uhland Maxwell	GAS	4/15/2025	188.4	Caldwell
25INR0232	Isaac Solar	SOL	3/31/2026	51.6	Matagorda
25INR0328	Longbow BESS	BAT	11/13/2024	180.8	Brazoria
23INR0403	Connolly Storage	BAT	8/18/2023	125.4	Wise
24INR0147	Holy ESS	BAT	1/19/2023	209.3	Harris
24INR0397	Destiny Storage	BAT	9/21/2023	201.1	Harris
20INR0217	CAROL wind	WND	1/31/2024	165.4	Potter
21INR0240	La Casa Wind	WND	1/4/2024	148.4	Stephens
21INR0379	Ash Creek Solar	SOL	1/17/2024	417.7	Hill
23INR0030	Langer Solar	SOL	1/5/2024	249.8	Bosque
23INR0070	Chillingham Solar	SOL	1/30/2024	352.4	Bell
23INR0336	Bypass Battery Storage	BAT	1/9/2024	206.9	Fort Bend

GINR	Venus Switch to Sam Switch 345-kV Line Project	Fuel	Project COD	Max Capacity (~MW)	County
24INR0632	Cedro Hill Wind Repower	WND	1/30/2024	9.9	Webb
26INR0042	Valhalla Solar	SOL	1/5/2024	306.8	Brazoria
23INR0044	Parliament Solar U1	SOL	12/31/2024	250.4	Waller
23INR0044	Parliament Solar U2	SOL	12/31/2024	234.2	Waller
24INR0023	Compadre Solar U1	SOL	12/25/2024	194.7	Hill
24INR0023	Compadre Solar U2	SOL	12/25/2024	211.5	Hill
24INR0208	Eastbell Milam Solar II	SOL	12/20/2024	151.0	Milam
24INR0329	XE Murat Storage	BAT	12/14/2024	60.1	Harris
24INR0605	TEXAS GULF SULPHUR REPOWER	GAS	6/25/2024	94.0	Wharton
16INR0049	Nazareth Solar	SOL	3/24/2025	204.0	Castro
21INR0428	Nabatoto Solar North U1	SOL	2/1/2026	224.8	Leon
21INR0428	Nabatoto Solar North U2	SOL	2/1/2026	140.9	Leon
24INR0395	Berkman Storage	BAT	4/30/2026	150.9	Galveston
19INR0110	Azalea Springs Solar	SOL	5/31/2025	181.0	Angelina
20INR0222	Tyson Nick Solar	SOL	8/1/2025	90.5	Lamar
23INR0469	Big Elm Storage	BAT	11/10/2025	100.8	Bell
23INR0195	Desert Willow BESS	BAT	2/3/2025	154.4	Ellis
23INR0299	Anole BESS	BAT	2/9/2025	247.1	Dallas
22INR0526	Pine Forest BESS	BAT	10/29/2025	210.1	Hopkins
20INR0203	Pine Forest Solar	SOL	12/1/2025	301.5	Hopkins
24INR0198	Two Forks BESS	BAT	7/1/2027	309.0	Cooke
24INR0315	Black Springs BESS SLF	BAT	10/15/2025	120.7	Palo Pinto
24INR0631	Radian Storage SLF	BAT	12/31/2024	160.0	Brown
25INR0231	Apache Hill BESS	BAT	11/15/2026	201.2	Hood
22INR0554	Platinum Storage	BAT	3/3/2025	309.5	Fannin
23INR0118	Blevins Solar	SOL	7/1/2025	271.6	Falls
23INR0119	Blevins Storage	BAT	7/1/2025	181.3	Falls

Table A.3: Project Related Document

No	Document Name	Attachment
1	Wilmer 345/138-kV Switch Project RPG 070224.pdf	Wilmer 345-138 kV Switch RPG_070224.